

material to [the] a surface of a substrate using a subtractive method, an additive method, or both subtractive and additive methods, respectively to produce high-surface area texturing of the surface that results in an increase in the surface area by at least 10-fold to 100,000-fold.

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cont.

24. (Amended) The high-surface [are] area textured substrate of claim 23, wherein the substrate is selected from the group consisting of polymeric materials, ceramic materials, glass materials, metal materials, composites thereof and laminates thereof.

Please add new claims 77 and 78 as follows:

77. (New) The substrate of claim 23, wherein the increase in the surface area is at least 1,000-fold to 100,000-fold.

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78. (New) The substrate of claim 77, wherein the increase in the surface area is at least 10,000-fold to 100,000-fold.

REMARKS

INTRODUCTORY COMMENTS:

In a previous Action, the claims were subjected to a restriction requirement under 35 U.S.C. §121. The claims were classified in three groups, Groups I-III, drawn to methods for producing textured surfaces (claims 1-11), textured substrates (23-70), and a replication method, (71-76), respectively. An election of the claims of Group II was made with traverse. However, the Examiner made the restriction requirement final. Claim 1-22 and 71-76 were withdrawn from consideration as being directed to a non-elected invention. Claims 28, 47, 51 and 70 were also withdrawn by the Examiner as being part of the non-elected species. Thus, claims 23-27, 29-46, 48-50 and 52-69 are now pending.

In this Office Action, all pending claims were rejected under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over either one of U.S. Patent Nos. 5,571,410 to Swedberg et al. or 5,658,413 to Kaltenbach et al.

The rejections are addressed in part by the above amendments to the claims and are otherwise traversed for reasons which will be discussed in detail below.

THE ABOVE AMENDMENTS AND THE NEW CLAIMS:

Claim 23 has been amended to clarify that the process by which the claimed substrate is formed increases the substrate surface area by at least 10-fold to 100,000-fold. Claim 77 has been added to recite that the initial surface area of the substrate is increased by at least 1,000-fold to 100,000-fold. Similarly, claim 78 has been added to recite that the initial surface area of the substrate is increased by at least 10,000-fold to 100,000-fold. Support for these amended and new claims can be found, e.g., on page 14, lines 9-12 in the application as filed. As all amended and new claims are supported by the original disclosure, no new matter has been added.

In addition, claim 24 has been amended to correct an obvious typographical error.

For the Examiner's convenience, the pending claims as amended and the new claims are listed in Appendix A.

OVERVIEW OF THE INVENTION AS CLAIMED:

The invention relates to a high-surface area textured substrate prepared by a process involving subtracting a material from, adding material to, or both subtracting material from and adding material to a surface of a substrate. As a result, the surface is textured and has a surface area that has been increased by at least one order of magnitude. Examples of such textured surfaces are illustrated and described, e.g., in FIG. 4A-H and accompanying text of the application, respectively.

THE 35 U.S.C. §102(b) REJECTION OVER SWEDBERG ET AL. OR KALTENBACH ET AL.:

The Examiner has rejected claims 23-27, 29-46, 48-50 and 52-59 under 35 U.S.C. 102(b) as anticipated by either one of Swedberg et al. or Kaltenbach et al., each originally submitted with an Information Disclosure Statement by the applicants. To support these rejections, the Examiner asserted that laser ablative techniques are disclosed by each document as preferred methods to provide a high surface texturing of the substrate through a subtractive process. The Examiner characterized the claims as drawn to a high-surface area textured substrate prepared by

a subtractive process to produce high-surface area texturing of the surface and thus asserted that each claim is anticipated. Moreover, the Examiner stated that inherency is relied upon in issuing a combination rejection under 35 U.S.C. §102/103.

As an initial matter, applicants point out that neither Swedberg et al. nor Kaltenbach et al. discloses high-surface area texturing as defined on page 14, lines 9-12 of the application. This section of the specification clearly recites that the term "'high-surface area' . . . [intends] a surface area that, after treatment . . . , is at least 10-fold to 100,000 greater . . ." While laser ablation can be a technique for removing material from a substrate, neither reference makes any disclosure relating to high-surface area texturing or increasing surface area using laser ablation. In addition, the claims have been amended to clarify that high-surface area texturing refers to an increase in surface area by at least 10-fold to 100,000-fold. Since it is axiomatic that anticipation requires a showing that all elements of a claimed invention are disclosed in a single prior art reference, *In re Bond*, 15 U.S.P.Q. 2d 1566, 1567 (Fed. Cir. 1990) and this is not the case here, neither Swedberg et al. nor Kaltenbach et al. anticipates the pending claims.

Moreover, applicants respectfully disagree with the Examiner's contention that inherency is a proper basis for this rejection. Applicants submit that disclosure with respect to laser ablative removal of material from a substrate surface does not inherently disclose an increase in surface area. For example, laser ablation may be employed to flatten an irregular, uneven or rough surface, thereby producing a smooth surface having a reduced area. Thus, depending on the original surface of a substrate, forming features such microchannels on a surface through laser ablation removal does not necessarily increase the surface area of the substrate surface. Moreover, removing material from a solid form will always reduce the volume of the form, and the smaller of two solid forms having the same shape will have a smaller surface area. Thus, neither Swedberg et al. nor Kaltenbach et al. inherently discloses high-surface area texturing or a method increasing the surface area of a substrate through a subtractive process as the Examiner contends.

THE 35 U.S.C. §103(A) REJECTION OVER SWEDBERG ET AL. OR KALTENBACH ET AL.

Claims 23-27, 29-46, 48-50 and 52-59 have been rejected as obvious over either one of Swedberg et al. or Kaltenbach et al. The Examiner has stated that each of these two references

renders the independent claim *prima facie* obvious. However, the Examiner admits that "all specific dependent claim limitation may not be specifically pointed out or distinctly claimed" in the cited patents. Nevertheless, the Examiner asserts that such limitations are also *prima facie* obvious modifications to the generic teachings absent objective evidence of high probative value to the contrary.

To establish *prima facie* obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the reference(s) themselves or in the knowledge generally available to one of ordinary skill in the art, to modify a reference's teaching. Second, there must be a reasonable expectation of success, and third, the prior art reference must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on an applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). In this instance, the three criteria have not been met.

The first criterion has not been met because the Examiner has cited no reason why one of ordinary skill in the art would modify the teaching of either Swedberg et al. or Kaltenbach et al. to increase the area of a substrate surface. As discussed above, neither patent expressly or inherently discloses a surface area increase. Moreover, the word "texture" does not even appear in either Swedberg et al. or Kaltenbach et al. Thus, the Examiner has employed improper hindsight analysis in issuing this rejection because there is no reason given as to why a reference disclosing laser ablation would be read as teaching texturing through an increase in surface area, without prior knowledge of applicants' invention.

Moreover, neither Swedberg et al. nor Kaltenbach et al. discloses or suggests all claim limitations. As now amended, each claim requires a surface area increase of at least 10-fold to 100,000-fold. This means that the claims require a substantial surface area increase of at least one to five orders of magnitude. It would not be obvious in view of either Swedberg et al. or Kaltenbach et al. to increase surface area by such a great extent. In addition, as discussed above, texturing is not involved in either Swedberg et al. or Kaltenbach et al. For the above reasons, *prima facie* obviousness has not been established, and the rejection is in error. Reconsideration and withdrawal of the rejection is accordingly respectfully requested.

CONCLUSION

For all of the above reasons, it is submitted the pending claims define an invention that is patentable over the art. As the application is now in condition for allowance, a prompt indication to that effect would be appreciated. Should the Examiner have any questions concerning this communication, he is welcome to contact Mike Beck at (650) 857-3864.

Respectfully submitted,

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Date

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